UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte ALAN MARK SCHILOWITZ,
DAVID JOHN RICKEARD,
JOHN RICHARD BATEMAN and NICHOLAS MANN

Appeal No. 2005-1407
Application No. 09/978,510

ON BRIEF

Before OWENS, TIMM, and DELMENDO, *Administrative Patent Judges.*

OWENS, *Administrative Patent Judge.*

DECISION ON APPEAL

This appeal is from the examiner's final rejection of claims 1, 3, 7, 9, 11 and 12. These are all of the claims remaining in the application.

THE INVENTION

Appellants claim a method of using lower density fuels to reduce emissions in high pressure common rail fuel injected diesel engines without experiencing a substantial loss in power. Claim 1 is illustrative:

1. A method for reducing emissions of common rail fuel system compression ignition engine without substantial reduction in acceleration, the method comprising running said engine on a fuel comprising a diesel fuel characterized by having a density of about 0.825 g/cc or less, a viscosity of about 2.6 cSt or less at 40°C, and a sulfur content of about 0.05 wt% or less.

THE REFERENCES

Barry et al. (Barry) 5,976,201 Nov. 2, 1999

THE REJECTIONS

Claims 1, 3, 7, 9, 11 and 12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Barry.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with the examiner that the invention recited in appellants' claims 1, 3, 7, 9, 11 and 12 would have been *prima facie* obvious to one of ordinary skill in the art at the time of appellants' invention over the applied reference. The evidence submitted by appellants has not established unexpected results to overcome the *prima facie* case of obviousness. Accordingly, we affirm the rejection.

Appellants state that the claims stand or fall together (brief, page 3). We therefore limit our discussion to one claim, i.e., claim 1, the sole independent claim. *See In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 C.F.R. 1.192(c)(7)(1997).

The examiner has the initial burden of establishing a *prima facie* case of obviousness. To establish a *prima facie* case of

obviousness, there must be some suggestion, motivation, or teaching in the references that would have led a person of ordinary skill in the art to modify the references in a way that would produce the claimed invention. *See generally Pro-Mold v. Great Lakes Plastic*, 75 F.3d 1568, 37 USPQ2d 1626 (Fed. Cir. 1996). The motivation or suggestion to modify the references may come from the references themselves, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. *See id.* To show a *prima facie* case of obviousness, the modification must also have a reasonable expectation of success. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The Barry reference teaches diesel fuels having a cetane number in the range of 50 to 60, a specific gravity typically in the range of 0.82 to 0.83, a viscosity typically in the range of 1.7 to 1.9 cS at 40°C, and a sulfur content no greater than 0.1 wt% (col. 2, lines 21, 60-67). Barry discloses that the use of these low density fuels in diesel engines will produce low levels of emissions, making the use of these fuels particularly suitable in underground diesel-engined mining equipment (col. 1, lines 12-14, 60-61). Barry does not disclose utilizing the fuels in high pressure common rail engines.

The examiner argues that it would have been obvious to modify the teachings of Barry by using the fuel of Barry in a high pressure common rail engine "because one would utilize a known diesel fuel in any diesel engine regardless of its specific features and expect the engine to work effectively" (answer, page 3).

We conclude that a *prima facie* case of obviousness has been made. Barry would have suggested using low density diesel fuels in engines to produce low levels of engine emissions (col. 1, lines 56-57). Barry also teaches that the low density diesel fuel compositions are "capable of reducing all of the currently regulated emissions subject to government regulation" (col. 1, lines 62-63). While Barry discloses that the low density diesel fuels are particularly suitable for use in underground diesel-engine mining equipment, Barry would not have suggested this to be the only use (col. 1, lines 60-61; col. 5, lines 24-27). One of ordinary skill in the art would have been motivated to use low emissions fuels in any diesel engine, including a high pressure common rail diesel engine, and reasonably expect the use to result in a reduction of engine emissions.

Once the examiner has met the burden of proof for a case of *prima facie* obviousness, the burden of proof shifts to the

applicant to overcome the *prima facie* case with arguments and/or evidence. Obviousness is then determined by considering the evidence as a whole. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

Appellants do not dispute the *prima facie* case of obviousness; instead, appellants try to overcome the *prima facie* case by arguing unexpected results (see brief, page 8). Specifically, appellants argue that the use of low emission fuels in high pressure common rail fuel injected engines results in "a *smaller* loss in power than one has come to expect in regard to the use of such fuels in other types of diesel engines based on the teachings of the literature" (emphasis omitted) (brief, page 5). Appellants rely on the Automotive Fuels Handbook to show that engine power decreases as fuel density decreases (brief, page 5). Appellants assert that the data points in Figure 1[1] of the Handbook show that the use of low density fuel in other diesel engines results in a much greater loss in power than the power loss experienced by a high pressure common rail engine (brief, page 5). The power loss in appellants' invention

[1] Figure 1 is reproduced from P. Heinz, *Engine Performance and Emissions With Future-Type Diesel Fuels*, Institute of Mechanical Engineers International Conference on Petroleum Based Fuels and Automotive Applications, Paper No. C306/86 (1986).

is 0.24% per 0.01 g/ml decrease (brief, page 6), while the power losses for the direct and indirect injection diesel engines in Figure 1 range from 0.4% to 1.6% per 0.01 g/ml decrease.

We find the evidence presented by the appellants does not overcome the *prima facie* case of obviousness for the following reasons.

First, appellants' showing of unexpected results has not compared appellant's claimed invention to the closest prior art. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991); *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984). Appellants rely on Figure 1 to show unexpected results, however, the closest prior art is Barry. The properties of the fuels used in appellants' invention are essentially the same as the fuels disclosed in Barry and Barry tests two of the fuels (LEDF-1 and LEDF-2) for emissions in Cummins GBT and GM 6.5 liter engines (Table 2). Hence, the proper comparison with the closest prior art is a comparison of the power loss using appellants' fuel in a common rail fuel system compression ignition engine versus the power loss using Barry's fuels LEDF-1 and LEDF-2 in Cummins GBT and GM 6.5 liter diesel engines.

Second, even if Figure 1 were considered the closest prior art, it is not enough for appellants to overcome the *prima facie* obviousiness by showing that the results from appellants' invention are different from the results in Figure 1. Appellants must show that the difference in the results is an unexpected difference. *See In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973); *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). Appellants argue that one of ordinary skill in the art would not have expected the use of low density fuels in high pressure common rail engines to result in a smaller power loss as compared to other diesel engines (brief, page 5). The examiner, however, has submitted evidence which, the examiner argues, indicates that high pressure common rail engines will perform better than common diesel engines, regardless of the type of fuel used in the engines (answer, p. 3). Appellants have not taken differences which exist between high pressure common rail engines and common diesel engines into account and submitted evidence which shows that regardless of those differences, one of ordinary skill would have expected the power loss resulting from the use of low density fuels in high pressure common rail engines to have fallen within the range of Figure 1. Appellants have

merely provided attorney argument, and such argument cannot take the place of evidence. *See In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); *In re Payne*, 606 F.2d 303, 315, 203 USPQ 245, 256 (CCPA 1979); *In re Greenfield*, 571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1974).

Moreover, appellants have not provided a side-by-side comparison of the claimed invention with the methods used to obtain the data in Figure 1 because appellants have not shown that the method used to measure engine performance in Figure 1 is the same method used by appellants to measure engine performance. Figure 1 uses the European ECE-24 method, but the Heinz reference does not describe the procedure. Appellants measure power by calculating the length of time to accelerate the high pressure common rail engine from 50 km/hr to 120 km/hr (see specification, page 5; lines 20-22). Appellants have not carried the burden of showing that these two methods are comparable.

For the above reasons we conclude that the method claimed in the appellants' claims 1, 3, 7, 9, 11 and 12 would have been obvious to one of ordinary skill in the art over the teachings of Barry.

DECISION

The rejection of claims 1, 3, 7, 9, 11 and 12 under 35 U.S.C. § 103 over Barry is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

TERRY J. OWENS
Administration Patent Judge

CATHERINE TIMM
Administration Patent Judge

ROMULO H. DELMENDO
Administration Patent Judge

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